

Message exchange handling concept.**Background of the Invention**

- 5 The invention relates to handling of messages between wireless communication terminals in a communication network.

Communication terminals for use in cellular communication networks are basically designed for voice communication. In the GSM system text
10 messages may be sent via a point-to point short message service provided by the network. New phones having improved text editors have made it more popular to use short message services and recently it has been observed by some operators that the use of short message services corresponds to 10 percent of the network traffic. Many operators see a significantly lower message
15 percentage of the network traffic. However there is an indication saying that the message based traffic will rise in the coming years. Now it is possible to send a message from one terminal to another and to send a reply the opposite way.

Therefore there will be a need for providing an improved message exchange
20 handling concept.

Summery of the invention

According to a first aspect of the invention there is provided a method for handling a message exchange session between wireless communication
25 terminals via a wireless network, and including steps of initiating a message exchange session by identifying in a first communication terminal at least one other communication terminal be invited to participate in the message exchange session, inputting a message text, and transmitting said message text to said at least one other communication terminal. The received message is responded
30 by inputting a message text for replying to the received message, adding said inputted reply message text to the received message text, whereby the

aggregate message text includes the message exchange session history, and transmitting said aggregate message text to the other communication terminal being parties in the message exchange session.

- 5 Hereby it is possible to transmit the message history, or at least the newest part of it, between the terminals during the session. The users will have a possibility to just scroll a few lines to see the background for a recently received message. This is an extremely important feature as long as the major part of the mobile phones only shows 3-5 lines in the display. Advantageously the originator of
10 each input in the history is identified with a chat name or the like.

- The first aspect of the invention is also related to a wireless communication terminal having a message exchange session handling application for handling messages in a message exchange session in a wireless
15 communication system. This terminal comprises a software application having means for initiating a message exchange session, said initiating means includes means for identifying at least one other communication terminal to be invited to participate in the message exchange session and means for entering a text input as a message text. Furthermore the terminal comprises a
20 transmitter for transmitting said message text to said at least one other communication terminal, and a receiver for receiving a reply from said at least one other communication terminal. The software application furthermore having means for replying to a message during a message exchange session, and the replying means includes means for entering a text input, and means
25 for adding said text input to the received message text for generating an aggregate text message being replied by means of the transmitter.

- A computer program product stored on a computer readable storage medium, comprises according to the first aspect of the invention computer readable
30 program code means for replying to a message during a message exchange session in a wireless communication system, said computer readable program code means provides a message exchange session handling

application in a wireless communication terminal, and said computer readable program code means handles a text input entered by the user, and adds said text input to the received message text for generating an aggregate message text for replying. Such a computer program product may be flashed into the terminal at a service office or via the data port of the terminal e.g. via a Personal Computer e.g. having Internet access.

According to a second aspect of the invention there is provided a method for handling a message exchange session between wireless communication terminals via a wireless network, and including steps of sending from a wireless communication terminal by means of a point-to point short message service in the wireless network a message containing a request for participating in a message exchange session, routing the request message from the wireless communication terminal to a message exchange session handling server via the wireless network, connecting in the message exchange session handling server the requesting wireless communication terminal to a group of communication terminals, handling a message text in said message exchange session handling server by succesively adding received message text from group of communication terminals to the message text in order to update the message text, and transmitting the updated message text to the group of communication terminals participating in the message exchange session.

Hereby it is possible for an operator to set up a message exchange session between several phones. The participants do not know each other and the chat session will be anonymous.

The second aspect of the invention is also related to a system for handling a message exchange session between wireless communication terminals via a wireless network. The system includes means for handling a point-to point short message service in the wireless network, a message exchange session handling server, and a group of wireless communication terminals accessing said message exchange session handling server via said point-to point short

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one of the communication terminals listed on said list, and means for transmitting the reply from said one of the communication terminals to the communication terminals listed on said list.

5 Brief Description of the Drawing

For a better understanding of the present invention and to understand how the same may be brought into effect reference will now be made by way of example only to the accompanying drawings in which:

- 10 Fig. 1 illustrates a preferred embodiment of a hand portable phone according to the invention.

Fig. 2 schematically shows the essential parts of a telephone for communication with a cellular network.

- 15 Fig. 3 shows a display sequence illustrating the initiation of a chat session according to the preferred embodiment of the invention.

- Fig. 4 shows a display sequence illustrating the message response in the chat session according to the preferred embodiment of the invention.
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Fig. 5 shows a display sequence illustrating a later stage in the chat session according to the preferred embodiment of the invention.

- 25 Fig. 6 shows a flow chart illustrating the steps of the message handling application according to the preferred embodiment of the invention.

- Fig. 7 shows an example of the interaction between the mobile terminals and a chat server in a chat session based on a chat server in a network according to a second embodiment of the invention.
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Fig. 8 shows a display sequence illustrating a chat session based on distribution lists according to a third embodiment of the invention.

Fig. 9 illustrates the message handling according to a third embodiment of the invention.

Fig. 1 shows a preferred embodiment of a phone according to the invention, and it will be seen that the phone, which is generally designated by 1, comprises a user interface having a keypad 2, a display 3, an on/off button 4, a speaker 5 (only openings are visible in the present view), and a microphone 6 (openings in bottom not visible in the present view). The phone 1 according to the preferred embodiment is adapted for communication via a cellular network.

According to the first embodiment shown in fig. 1, the keypad 2 has a first group 7 of keys including twelve alphanumeric keys. In addition to this the keypad 2 has one soft keys 8, a scroll key 10 for navigating the cursor in the display 3, a "clear key" 9 for clearing one or more letters from the display. The calls are handled by means of the soft keys 8, the scroll key 10 and the "clear key" 9. The present functionality of the soft key 8 is shown in a field in the display 3 just above the soft key 8. A phone having a single soft key is described in two pending US patent applications 08/975,126 and 08/975,232 filed by the applicant.

Fig. 2 schematically shows the most important parts of a preferred embodiment of the phone, said parts being essential to the understanding of the invention. The preferred embodiment of the phone of the invention is adapted for use in connection with the GSM 900MHz and GSM 1800 MHz network, but, of course, the invention may also be applied in connection with other cellular phone networks or cordless networks. A processor 18 controls the communication with the network via a transmitter/receiver circuit 19 and an antenna 20.

The microphone 6 transforms the user's speech into analog signals, and the analog signals formed thereby are A/D converted in an A/D converter (not shown) before the speech encoding in an audio part 14. The encoded speech signal is transferred to the processor 18, which i.a. supports the GSM terminal software. The audio part 14 decodes the audio signal, which is transferred to the earpiece 5 via a D/A converter (not shown).

The processor 18 also forms the interface to the peripheral units of the apparatus, including a RAM memory 17a and a Flash ROM memory 17b, a SIM card 16, the display 3 and the keypad 2.

Message handling according to the preferred embodiment of the invention is based on using a standard wireless messaging concept, e.g. the Short Messaging Service (SMS) well known from the GSM specification. The user sends an SMS message whenever he wants to contribute to the chatting, and he will receive a short message whenever another user has typed a new text. The chatting does not necessarily have to be based on the use of SMS messages but could also include E-mail being converted to SMS messages at the chat server and forwarded to the chat participants as an ordinary chat message. Hereby the chat participants may be identified by phone number or E-mail address or the like. Furthermore messages for communication specifications other than GSM could be used.

25 **First embodiment – point to point chat.**

According to the preferred embodiment the user is able to chat with another user, basically by allowing an easy swapping between message writing and message viewing. The user has to set up e.g. a phone number identifying one other specific other user for point to point chatting. With reference to fig. 3, a chat display sequence is shown for a Nokia phone having a single soft key 8 as shown in fig. 1 will be shown.

The first display 100 in fig. 3 is a chat entry display in the main menu (or inside the messages menu) of the phone, and in the preferred embodiment it includes a text label 101 defining the present functionality "select" of the soft key 8, a menu status bar 102 informing the user about the present position (menu level 5) in the menu structure and an animating icon 103 presenting the application for the user in a way so he can recognize it.

Selecting "chat" allows the user to define what number to chat with (point-to-point chatting). In the second display 104 the user is invited to enter a very short chat name –preferably only one or two characters – in a text box 104 and a marking bar 105 indicates the position of the next entered character. When the user has entered the chat name he presses the soft key 8 having the present functionality "OK" as shown by the text label 101.

Empty names could also be accepted as chat names, and preferably the name used last time is displayed as default, whereby the user only has to accept the name if he will not make amendments. When the user accepts the chat name he is (in the third display) asked for the number – either a single user or a server – for the chatting.

When user has entered a chat number or fetched a chat number from the phonebook memory of the phone, he will immediately enter the "normal" SMS editor for a GSM phone, as shown in the fourth display. Here the marking bar 105 indicates the position of the character to be entered, and digit 106 the maximum number of characters that can still be entered into the message.

By selecting "Send" the phone will immediately send the written text 107 to the number specified for chatting and this will be indicated by an animation 108 shown in the sixth display. If the user presses the scroll key 10 he will get access to the alternative options available in the soft key 8. These options may include e.g. "T9 options", "Save" and "Insert template". The phone will

now re-enter the text editor as shown in the seventh display of fig. 3. The other user receives the chat message as a normal message (normal SMS).

Fig. 4 refers to the situation where a reply has been received from the other chatter, and this message will be received as a standard SMS. This is illustrated in the first display in fig. 4. If the user wants to read the received message he presses the soft key 8 having the present functionality "read" as shown by the text label 101. The message "Hi Jacob" is displayed in the second display and the soft key 8 now has the functionality "options" as shown by the text label 101.

When the user selects the "options" functionality a list 110 of options appears on the display as shown in the third display with one of the options 111 ("chat") highlighted (or reversed in colours). The "reply" and the "erase" functionalities are standard short message operations, and if one of these is selected the message will be handled as such. However if the user selects "chat" the text entry display shown as the fourth display will appear.

User enters text entry display or the chat editor and can send directly (several times) to the sender of the original message. The text entry display will look like the "normal" SMS editor for a GSM phone and will include the marking bar 105 indicating the position of the character to be entered, and the digit 106 that indicates the maximum number of characters that can still be entered into the message.

By selecting "Send" the phone will immediately send the written text 107 to the number specified for chatting and this will be indicated by an animation 108 shown in the sixth display. If the user presses the scroll key 10 he will get access to the alternative options available in the soft key 8. These options may include e.g. "T9 options", "Save" and "Insert template". The phone will now re-enter the text editor as shown in the seventh display of fig. 3.

Fig. 5 shows how the user can easily receive chat messages in idle mode as well as in the chatting editor, as shown in the first display. When a message in an ongoing chat session is received, the processor 18 allows this message from the other person to directly pop-up in the editor.

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Therefore the received message will be displayed immediately to the user – even if the user is in the middle of writing. As seen in the second display of the chat display displays simultaneously several (here four) individual chat messages. Each of these messages starts with a short chat name 112

10 identifying the person who sent the message. The chat name 112 was explained in fig. 3 and according to the present invention Christian uses the chatname "C" and Jacob the chat name "J". The chat name 112 is followed by a by a simicolon as spacing sign 113 and then the message text 114.

15 The text message may be divided into several lines and according to the preferred embodiment the text message is terminated with a line break. The newest input is automatically put on top of the older input when displayed. When pressing the "OK" soft key 8 the phone will bring the user back to the chat editor (as shown in the third display of fig. 5) to e.g. reply immediately.

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When the user has entered the text to be sent, the processor 18 when sending automatically simply adding the "old" text after the new text to be sent. Hereby the full chat history is included in the displayed text.

25 According to the preferred embodiment only messages received from a chatter will be displayed this way. Chat messages will not be stored on the SIM card as normal messages do. When the user writes a second text or a response, and selects the "Send" option for the soft key, the phone will now do as follows:

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- Take the last received chat message and add the new text entered by the user to the beginning of the message – always on a new line.

- Maximum one SMS is used. When the message is "full" (a SMS may contain 160 characters as a default standard), the text is removed line wise from the end of the message.

5 Since all chat messages are sent as standard SMS (including the initial chat message), the person receiving an initial chat message will receive it as a standard SMS message. The reception of a message is shown as the first display of fig. 4.

10 The embodiment explained above may be implemented as a new software application handling the messages. It is the user who determines who to invite to participate in the chat session. This is basically explained below with reference to fig. 6.

15 From idle mode (step 200) the user initiates the chat session by selecting chat from the menu (step 201). Then the user is requested to input a chat name (step 202) if a chat name is not stored as a default name. The user is then requested to input a chat number (step 203), and when this is done the user enters the chat editor (step 210). When the user wants to exit the chat editor,
20 but does not want to send the message he exits at step 214, where he e.g. may save the written text for later use or simply wants to quit without saving.

If he at step 211 indicates that he wants to send the chat message the chat
25 history or at least a part of it is added at step 212, and the message is sent at step 213. Hereafter the phone goes back to idle mode at step 200.

In idle mode (step 200) when a message is received in step 204 and the user is offered the option to read the message in step 205. If the user does not
30 want to read the message the phone goes back to idle mode (step 200), otherwise the received message is displayed at step 206, and the user is

asked whether he wants to reply the message as chat in step 207. If he does not want to reply to the message the chat the message is handled as an ordinary message at step 215. If he does want to reply to the message as the chat the message it is checked at step 208 whether a chat name has been entered. If not the chat name may be entered at 209 and the phone enters the chat editor at step 210.

Chat based on a chat server.

According to this embodiment the user is still allowed to easily swap between message writing and message viewing. The user sets up a phone number to a chat server 40 in the Short Message Service Center 44 as indicated in fig. 5. The chat service is provided by the network, and may include a server containing chat rooms etc. When the user uses the chat room phone number the server 40 allows the requesting terminal to access an ongoing chat handled by the server. The chatting does not necessarily have to be based on the use of SMS messages but could also include E-mail being converted to SMS messages at the chat server and forwarded to the chat participants as an ordinary chat message. Hereby the chat participants may be identified by phone number or E-mail address or the like.

A preferred embodiment of the system architecture for managing the credit system is shown in fig. 7. A Home Location Register 45 (HLR) contains a database including relevant subscriber information for the provision of the telecommunication service. A CCITT specified network 42 interconnects the individual parts of the system. An SMS gateway & SMS interworking Mobile Switching Center (MSC) 43 is a switching unit routing a message or a call to a Mobile Station 30-34 (the phone 1). A Short Message Service Center 44 (SMSC) and the SMS gateway & SMS interworking Mobile Switching Center (MSC) 43 handles and routes the SMS's between the Short Message Service Center 44 and the Network 42. From the Network 42 the messages are routed

to the Mobile Station 30-34 via a Mobile Switching Center (MSC) 41-42. Base Transceiver Station (BTS) 47-49 establish the air connection to the Mobile Stations 30-34.

- 5 According to a second embodiment of the invention a network operator or other third party company handling a chat server 40 could offer a chat function between persons not knowing each other. For example a network operator may have a chat server 40 supporting a feature where the user may send a chat request from his mobile station 30-34 to the server 40 by means of a
- 10 short message using a special phone number. This server 40 automatically places people sending a similar request message to the server 40 into "chat groups" or "chat rooms". Whenever a user being part of such a group 30-34, sends a message to the server 40, the server 40 adds the text from the message on top of the previous communication in the chat group and
- 15 forwards the up-dated communication in a message to all the other persons in the group 30-34. The chat server 40 is responsible for the distribution of the text messages and the distribution lists.

- When using gateways in the network the user will be allowed to specify an E-
- 20 mail address for the chat server, and not just a phone number. The user should furthermore be allowed to specify two phone numbers/E-mail addresses; one to which chat message is sent and one from which the server messages are received.

25 **Chat based on distribution lists.**

- According to a third embodiment of the invention the initiating user first has to select a distribution list to chat with. The initiating user will according to the present charging concept have to pay for a substantial part of the messages, because all messages will go through him. However there will be a market for
- 30 this concept because it may be regarded as a "conference chat" similar to a conference call having multiple participants invited by an initiating user.

This third embodiment will be illustrated with reference to fig. 8. In the first display 100 (similar to the first display of fig. 3) is a chat entry display in the main menu of the phone, and as in the first embodiment this display includes
 5 a text label 101 defining the present functionality of the soft key 8, a menu status bar 102 and an animating icon 103.

By selecting "chat" the phone allows the user to define what number to chat with. By selecting "Enter Number" or "Phonebook" in the second display the
 10 user is allowed to target a phone number for his chatting request - either point-to-point chatting with another phone user as explained with reference to the first embodiment or a chat server based multi user chat session as explained with reference to the second embodiment. The third embodiment does allow the user to initiate a conference chat session where the
 15 participants are invited by the initiating user. The user has to move the hight lighting cursor 115 to the "Distribution list" by using the scroll key 10 and selecting the operation by pressing the selection key 8.

In the third embodiment the "Chat menu" has the sub menus "Enter number" for manually inputting the chat phone number, "Phonebook" for picking the
 20 chat phone number up from the phonebook (this is the same way as getting a phone number from the phonebook for an SMS message), and "Distribution list". The "Distribution list" submenus includes:

1. "Existing lists" – each including a number of already appointed
 25 participants for conference chat. These lists have names the which the user may scroll when he has selected the item;
2. "Add new list" – by means of which the user may name the distribution list, appoint members for a distribution list and add the distribution list to the "Existing lists" list; and
- 30 3. "Edit list" – here the user is allowed to select a distribution list from "Existing lists" and edit the distribution list name and

add/delete/rename one or more of the appointed members of the distribution list.

If the user selects "Distribution list" in the second display he is allowed to invite users included in user-defined distribution lists "Erfa-group", "Sales" and "My group" to participate in a conference chat. When the user has selected one distribution list in the third display, e.g. the highlighted one 115, he may enter a message as indicated in the fourth and fifth display of fig. 8.

When the initiating user 300 (see fig. 9) finalizes the message and presses the "Send" softkey 8 the phone starts successively sending this first message to each of the conference chat participants 310 listed on the selected distribution list (this includes N individuals 311-313). When one of the other conference chat participants 312 replies (second input 315) to this first message, the reply includes the reply message on top of the original message, and the reply message is transmitted to the initiating user alone. The initiating user retransmits 316 the reply message to all the conference chat participants listed on the selected distribution list – advantageously to all except the replying one.

The initiating user may of course add his comments prior to the re-transmission. The initiating user may select whether his phone automatically re-transmits this reply message or whether he should accept the re-transmission. The phone of the initiating user acts as chat server and the other parties will see this chat as a point-to-point chat with the initiating user, however they will see the texts (and chat names) of the entire conversation.

However if the phone retransmits the reply automatically the phone will have to distribute a third input 317 if the initiating user wants to make comments to the reply. Later on the N'th participant 313 makes an input 318 and this input is transmitted to the initiating user 300 who automatically re-transmits this

input to all the conference chat participants listed on the selected distribution list – advantageously to all except from the replying one.

Three party chat concept

- 5 In order to reduce the cost for the master (the initiating phone) of a e.g. three-point chat session, and if all the involved parties have a phone capable of doing a three-point chat , a setting to switch off the auto-forwarding of received short messages during the chatting could be offered.
- 10 This would make sense for e.g. "broadcasting" messages, then they can start by exchanging their phone numbers, and afterwards they can all enter three-point chatting (with the auto-forward switched off), and hereby each of the involved parties will send to both of the other chatters whenever they send a message; this will reduce the total amount of sent messages, and distribute
- 15 the costs more evenly (the user will only have to pay for outgoing messages).

- The suggested three-person chat in this document is actually not limited to three-person chatting. If several of the persons in the three-person chat have phones supporting three-party chat, one (or both) of the other chatters may
- 20 also initiate three-person chat (and hence include a fourth, fifth etc person to the chatting). All users will – due to the auto-forwarding – receive all chat messages sent by all chatters.

Chat based on distributed distribution lists.

- 25 The third embodiment is based on the existing GSM specification that does not allow use of distribution lists for SMS message sending. However if the specification in the future allows use of distribution lists for SMS messages the initial message could as a fourth embodiment contain all phone numbers of the conference chat participants listed on the selected distribution list, and
- 30 these numbers are then sent to all chatters – the other chatters can then use

the numbers inside the message to reply to the chat message. All participants will then send messages using this "distribution list".

Chat useability improvements

- 5 A further embodiment of the invention includes a further improvement of the invention. The chat application will here has a history display in addition to the chat editor window. When entering the chat menu the user has to select between a new chat session (and the editor where the user may enter targets for the chat session, chat name and text occurs), or chat histories (where the
- 10 user may select between the histories stored in the phone and identified by a label automatically generated based on the name of the originator of chat session and/or the time. This label may be renamable. When the user views the chat history (older messages send in the chat session), pressing the clear-key will bring the user back to the chat editor where he can enter new text. A
- 15 further press of the clear-key will cause the phone to jump out of the chat application. The user may according to this embodiment be offered an option to save the chat history as a text string so the text string may be used in another application, and e.g. forward it to a third person.
- 20 This concept is based on offering the user an additional option in the SMS based chat editor, called "Save History". This option is according to the described embodiment available only from the chat editor and not from the history viewing (since here we only have "OK" on the soft-key – for simplicity). The "Save History" option will simply save the history as a concatenated
- 25 message in the normal SMS Outbox.

- If the history is longer than supported, the history is truncated from the end (oldest) before saved. When the "Save History" function is selected, the user will get a confirmation note showing that the "history is stored" or that the
- 30 "history is stored to the Outbox" (so that user can find it afterwards). After a timeout, the phone returns to the Chat editor.

If the user – in the same chat session – chooses to save the history, there will be stored several messages in the Outbox (no overwriting). If the Outbox memory is full, user will get an error note, and the saving is discarded.

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What is claimed is:-

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